

What is claimed is:

1. A deburring tool adapted to be rotatably mounted in a chuck of a drive motor to perform deburring operations, said deburring tool comprising:

an arbor and a blade having a cutting head portion defined at one end thereof and a clip portion defined substantially at the other end of said blade opposite said head portion;

said blade mounted relative to said arbor such that said blade projects a predetermined distance from said arbor in an unstressed condition, said blade being sufficiently resiliently yieldable such that it can move inwardly with respect to said arbor during deburring operations, said clip portion adapted to flex to provide a spring-like force acting along said blade toward said head portion of said blade to facilitate insertion and removal of said blade relative to said deburring tool without use of any tools.

2. A deburring tool as set forth in claim 1, wherein said clip portion includes a lower jaw and an upper jaw disposed in spaced relation to said lower jaw, said lower and upper jaws adapted to flex with respect to each other to provide said spring-like force that aids in retaining said blade in said mounted condition with respect to said arbor.

3. A deburring tool as set forth in claim 2, wherein said clip portion further includes a reaction member that is operatively engaged by said lower and upper jaws, said lower and upper jaws being adapted to flex against said reaction member to provide said spring-like force, and said reaction member being adapted to support said blade relative to said deburring tool upon flexing of said lower and upper jaws.

4. A deburring tool as set forth in claim 3, wherein said reaction member is a clip pin that extends transversely to the longitudinal axis of said blade.

5. A deburring tool as set forth in claim 1, wherein said deburring tool further includes a retention pin, said blade further including a slot defined between said head and clip portions and adapted to receive said retention pin, said retention pin and said slot in said blade cooperating to retain said blade relative to said retention pin and to allow said blade to flex about said retention pin in a stressed condition of said blade when said blade moves inwardly with respect to said arbor during deburring operations.

6. A deburring tool as set forth in claim 5, wherein said slot in said blade defines an arc surface with an imaginary line extending substantially horizontally through the substantial midpoint of said slot, said arc surface subtending a predetermined angle " β " below said imaginary line and a predetermined angle " γ " above said imaginary line, said arc surface adapted to act as a bearing surface for said retention pin to retain said blade relative to said retention pin in the stressed condition of said blade.

7. A deburring tool as set forth in claim 6, wherein the sum of the angles " β " and " γ " is substantially 180°.

8. A deburring tool as set forth in claim 7, wherein the angle " β " is substantially 17.5° and the angle " γ " is substantially 162.5°.

9. A deburring tool as set forth in claim 6, wherein said slot in said blade further defines an arc surface subtending a predetermined angle “ δ ” above said imaginary line and adapted to act as a non-bearing surface such that a space is defined between said arc surface and said retention pin to allow translational displacement of said blade relative to said retention pin for removal and insertion of said blade.

10. A deburring tool as set forth in claim 9, wherein said angle “ δ ” is substantially 17.5°.

11. A deburring tool as set forth in claim 1, wherein said deburring tool further includes a pivot cradle adapted to pivotally support said blade and to adjust said predetermined distance that said cutting head projects from said arbor in an unstressed condition.

12. A deburring tool as set forth in claim 11, wherein said deburring tool further includes a retention pin and wherein said pivot cradle includes a body portion having a slot adapted to support said blade, said body portion adapted to pivot about said retention pin so as to adjust said predetermined distance that said cutting head projects from said arbor in said unstressed condition.

13. A deburring tool as set forth in claim 12, wherein said deburring tool further includes a holder having a central opening adapted to receive and mount said arbor and a cradle pocket that is adapted to receive and mount said pivot cradle, said pivot cradle including a tail portion, said deburring tool further including an adjusting screw operatively supported for

adjustable movement in said holder of said deburring tool so as to engage said tail portion of said pivot cradle and, thereby, adjustably pivot said pivot cradle about said retention pin.

14. A deburring tool adapted to be rotatably mounted in a chuck of a drive motor to perform deburring operations, said deburring tool comprising:

an arbor having a channel and a blade adapted to be received in said channel of said arbor, said blade having a cutting head portion defined at one end thereof that projects a predetermined distance from said arbor in an unstressed condition, said blade being sufficiently resiliently yieldable such that said blade can move inwardly with respect to said channel of said arbor during deburring operations; and

a pivot cradle adapted to pivotally support said blade and to adjust said predetermined distance that said head portion projects from said arbor in the unstressed condition.

15. A deburring tool as set forth in claim 14, wherein said deburring tool further includes a retention pin and wherein said pivot cradle includes a body having a slot adapted to support said blade, said body adapted to pivot about said retention pin so as to adjust said predetermined distance that said head portion projects from said arbor in the unstressed condition.

16. A deburring tool as set forth in claim 15, wherein said deburring tool further includes a holder having a central opening adapted to receive and mount said arbor and a cradle pocket that is adapted to receive and mount said pivot cradle, said pivot cradle including a tail portion, said deburring tool further including an adjusting screw operatively supported for

adjustable movement in said holder of said deburring tool so as to engage said tail portion of said pivot cradle and, thereby, adjustably pivot said pivot cradle about said retention pin.

17. A deburring tool as set forth in claim 14, wherein said deburring tool further includes a retention pin, said blade including a slot adapted to receive said retention pin and to flex about said retention pin in a stressed condition of said blade when said blade moves inwardly with respect to said channel of said arbor during deburring operations, said slot in said blade and said retention pin cooperating to retain said blade relative to said retention pin during deburring operations.

18. A deburring tool as set forth in claim 17, wherein said slot in said blade defines an arc surface with an imaginary line extending substantially horizontally through the substantial midpoint of said slot, said arc surface subtending a predetermined angle " β " below said imaginary line and a predetermined angle " γ " above said imaginary line, said arc surface adapted to act as a bearing surface for said retention pin to retain said blade relative to said retention pin in the stressed and unstressed position of said blade.

19. A deburring tool as set forth in claim 18, wherein the sum of the angles " β " and " γ " is substantially 180° .

20. A deburring tool as set forth in claim 19, wherein the angle " β " is substantially 17.5° and the angle " γ " is substantially 162.5° .

21. A deburring tool as set forth in claim 18, wherein said slot in said blade further defines an arc surface subtending a predetermined angle " δ " above said imaginary line and adapted to act as a non-bearing surface such that a space is defined between said arc surface subtending said predetermined angle " δ " and said retention pin to allow translational displacement of said blade relative to said retention pin for removal of said blade.

22. A deburring tool as set forth in claim 21, wherein said angle " δ " is substantially 17.5° .